Novel Optical Structure Type - The Optical Pulley System - Facilitates Deviation Amplification of Individual Photon Streams (non-waveform) in Compact Spaces in Support of Revolutionary 20 September 2023 SSD Indirect Read Mechanism

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Introduction

Increasing the storage capacity of solid-state drives requires increasing the number of disparate levels of charge in voltage cells which can be both reliably "written" to voltage cells and "read" from voltage cells.

The chief complication to efforts to increase the magic number that is the MLC count is the tendency of performing a read operation to drain small amounts of voltage from these voltage cells. If it were possible to assess the level of charge without draining any voltage at all, MLC counts in the thousands or perhaps hundreds of thousands would be possible, particularly when coupled with improved voltage gating techniques involving transiently complete hydrogen nanowire circuits.

In the publication of 20 September 2023, it was explained that a possible method for assessing the level of voltage in a voltage cell without draining is to emit polarity-controlled light made to pass in close proximity to each voltage cell and to assess the angular change to polarity induced by the altered magnetic properties of the voltage cell related to charge. Problematically, this deviation in polarity is difficult to distinguish through traditional polarimetric methods. Conversion of changes to polarity into an alteration of angular momentum may be accomplished, but would require a type of prism which is both novel and too large to fit into the limited space between voltage cell layers in an SSD. Therefore, rather than looking at polarity and entire waves of light, individual photon streams in which photons do not have time to phase and in which sheer angular momentum deviation is measured is the best way forward.

Abstract

The extent to which the trajectory of an individual photon may be altered by the increased magnetism near a voltage cell as a result of subtle differences in its level of charge (differences of a few hundred electrons) is so fractional so as to seem inconsequential. There must, however, be an effect upon photons passing near charged voltage cells. There only needs to be some effect, however infinitesimal, for useful data to be created from this interaction.

Toward the end of making use of that data, a novel optical mechanism may be constructed which is designed to amplify minute differences in angular momentum within compact spaces. All voltage cells would have some degree of charge and therefore would have unique magnetic conditions which would

predictably influence the trajectory of photons if the photon's proximity of passage and angle of passage could be controlled with sufficient precision.

Each voltage cell would need to be outfitted with its own light source designed to emit streams of individual photons which skim the voltage cell. These photons would, after passing the voltage cell the charge level of which they are designed to measure, would strike an extremely smooth nanomirror at a 45-degree angle. This would be the first step in the transport of the magnetically altered photons toward a novel optical mechanism that can enable the accurate measurement of subject changes to photonic trajectory. After striking a second mirror, the photons would once again be moving in parallel with the voltage cell layer in the above layer. This above layer (with many of these layers being sandwiched between voltage cell layers) would contain the *optical pulley system.* Mechanical pulleys are leverage multipliers which can enable objects of extreme weight to be lifted by a single person. Each time a mechanical pulley wheel is added to a series of wheels, the force needed to lift an object is cut in half. An optical pulley shares in common with this mechanical technology that spherical, glass nanospheres can be used in conjunction with one another in order to multiply small deviations in angular momentum until they can be measured with ease.

With the creative utilization of a single glass nanosphere and surrounding mirrors, deviations in photon position caused by magnetic fields of well under one picotesla in strength resulting in positional deviations of well under one one hundredth of one angstrom can be amplified so that extant photosensors can be used to measure deviations in the ultimate strike position which in which field strength (and thus charge) estimates are made by taking into account the number of bounces of light off of mirrors (as estimated by time of flight) along with the strike position of photons against a specialized sensor.

The mechanism facilitating this is deceptively simple. Light strikes a nanosphere an initial time and has its angular momentum altered increasingly depending upon by how much its strike position is off-center. After passing through the sphere a single time, the photons strike a mirror and passage is repeated. With each passage, the number of milliarcs of angular change increases exponentially. The nanosphere used for this purpose would be nested within a sort of dome structure which doubles as a reflective device and a position-specific photon detector.

The first few times such photons pass through the sphere, no measurable alteration to angular momentum would be detected. Beyond this, the angular deviations begin to add up and, before long, result in a detectable deviation. The number of bounces required as estimated by time of flight and the position within the sensor dome housing each nanosphere upon which photons strike determines the charge level assessment of the individual voltage cell.

Conclusion

If successful, it should be possible using this method to distinguish between hundreds of thousands of unique levels of charge within voltage cells as promised in the publication of 20 September 2023. Glass nanospheres, which already have application in optical processing and nanosoliton wave generation (for propulsion) now have yet another application in reading data from solid-state drives.